

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

VISUAL EFFECT INNOVATIONS, LLC

Plaintiff,

v.

**SAMSUNG ELECTRONICS AMERICA,
INC., and SAMSUNG ELECTRONICS
CO., LTD.**

Defendants.

Civil Action No. 2:18-cv-00184

JURY TRIAL DEMANDED

COMPLAINT FOR PATENT INFRINGEMENT

This is an action for patent infringement arising under the Patent Laws of the United States of America, 35 U.S.C. § 1 et seq. in which Plaintiff Visual Effect Innovations, LLC (“VEI” or “Plaintiff”) brings this patent infringement action against Defendants Samsung Electronics America, Inc. (“SEA”) and Samsung Electronics Co., Ltd. (“SEC”) (collectively, “Samsung”), and alleges as follows:

BACKGROUND

1. Plaintiff VEI is the assignee of all right, title, and interest in and to U.S. Patent No. 9,781,408, entitled “Faster state transitioning for continuous adjustable 3Deeps filter spectacles using multi-layered variable tint materials” (“the ’408 Patent,” attached as Exhibit A); and U.S. Patent No. 9,948,922, entitled “Faster State Transitioning For Continuous Adjustable 3deeps Filter Spectacles Using Multi-Layered Variable Tint Materials” (“the ’922 Patent,” attached as Exhibit B) (collectively, the “Patents-in-Suit”). VEI has the exclusive right to assert all causes of action arising under the Patents-in-Suit and the right to remedies for infringement thereof. VEI has the exclusive right to assert all causes of action arising under the Patents-in-Suit and the right to remedies for infringement thereof.

2. The inventors on the Patents-in-Suit are Kenneth Martin Jacobs and Ronald Steven Karpf.

3. Mr. Jacobs is the Distinguished Professor Emeritus of Cinema at SUNY Binghamton. He is the recipient of the American Film Institute's Maya Deren Independent Film and Video Artists Award, and the winner of the Los Angeles Film Critic's Douglas Edwards Experimental/Independent Film/Video Award. He is also the recipient of the Guggenheim Award and a special Rockefeller Foundation grant, and his work has been featured in prominent museums including the New York Museum of Modern Art, The American House in Paris, the Arsenal Theater in Berlin, the Louvre in Paris, and at the Getty Center in Los Angeles.

4. Mr. Karpf is the Founding Partner of bioinformatics company ADDIS Informatics, and Founding Partner of technology security company Geo Codex LLC. Mr. Karpf has an MA and Ph.D. in Mathematical Sciences.

5. The inventions claimed in the Patents-in-Suit are directed to unconventional improvements in the technology for displaying moving pictures, which has application in films, television and other display technology. In particular, these inventions are directed to, among other things, improvements in how continuous movement is displayed on presentation devices. *See* '408 patent, col. 2, lns. 16-32; '922 patent, col. 2, lns. 18-34.

6. As explained in the specifications, the claimed inventions originated as ways to solve problems arising in the technology used to portray continuous movement in the technology used to display films or movies in theaters. The specifications explain the traditional or conventional methods of displaying continuous movement in films or movies, which included:

The appearance of continuous movement, using only two substantially similar pictures, has been accomplished in live performance by simultaneous projection of both images onto a screen, wherein one picture may be slightly off-set from the other picture as they appear on the screen, and by rotating a two-bladed propeller, wherein the propeller blades are set off from one another by 180 degrees, in front of and between the two projectors such that the two images are made to both alternate and overlap in their appearances, with both images in turn alternating with an interval of complete darkness onscreen when both projections are blocked by the spinning propeller.

'408 patent, col. 4, lns. 42-53; '922 patent, col. 4, lns. 44-55. As further explained, this method produced "flicker," an unintended and undesirable effect of the transitions between film frames. *See, e.g.,* '408 patent, col. 50, lns. 58-64; '922 patent, col. 51, lns. 17-23. As the specifications also noted, in conventional video and computer-display "image-continuity depends likewise on this rapid on-off display," or "flicker," which was similarly disfavored. '408 patent, col. 50, lns. 47-64; '922 patent, col. 51, lns. 5-23.

7. The claimed inventions turn a negative into a positive and deliberately use "flicker" and the resulting "effects of emphatic flicker on the human optical/nervous system" to produce better visual results. '408 patent, col. 50, lns. 58-64; '922 patent, col. 51, lns. 17-23. In particular, the results include enhanced continuous movement, various artistic visual effects and depth illusions to be experienced by persons without properly functioning binocular vision. *See, e.g.,* '408 patent, col. 50, ln. 65- col. 51, ln. 23; '922 patent, col. 51, lns. 24-49.

8. One core technique initially invented to harness the power of "flicker" for this purpose included the use of a different "bridge frame" between two picture frames. As explained in the specification:

The method of the present invention entails repetitive presentation to the viewer of at least two substantially similar image pictures alternating with a third visual interval or bridging picture that is substantially dissimilar to the other substantially similar pictures in order to create the appearance of continuous, seamless and sustained directional movement.

'408 patent, col. 8, lns. 50-56; '922 patent, col. 8, lns. 52-58.

9. As seen in the Patents-in-Suit and others in this family, this "bridge frame" could include a black frame or different solid color frame or a blended image (e.g., an image which is a partial picture and partial black or other solid color frame). Other nuances of and improvements to this unconventional technique are disclosed and claimed within this patent family, including in the Patents-in-Suit. In this regard, this technique -- of adding a black frame or blended image between image frames -- also can be accomplished in a variety of ways, including not only by

“black frame insertion” but also by “backlight scanning” – where the lighting behind the screen is dimmed, in whole or in part, in planned intervals so as to achieve the same result, of inserting a black or partially blackened “frame” between two images. These unconventional inventive techniques are claimed in the accused claims of the Patents-in-Suit.

10. These unconventional inventive techniques claimed in the patents-in-suit have application in any device that displays moving pictures, including not only devices that display film or movies in theaters, but also televisions, projectors, computer screens, gaming consoles and a variety of other applications.

11. By making, using, selling, offering for sale, and importing products including but not limited to Samsung TVs, Samsung is infringing the claims of the Patents-in-Suit.

PARTIES

12. VEI is a Texas Limited Liability Company with a principal place of business at 1400 Preston Road, Suite 400, Plano, Texas 75093.

13. On information and belief, Samsung Electronics America, Inc. is a New York corporation with its principal place of business located at 85 Challenger Road, Ridgefield Park, NJ 07660. Samsung Electronics America, Inc. can be served through its registered agent CT Corporation System, 1999 Bryan Street, Suite 900, Dallas, TX 75201-3136.

14. Defendant Samsung Electronics Co., Ltd. is a Korean corporation with its principal place of business located at 129 Samsung-Ro, Maetan-3-dong, Yeongtong-gu, Seoul 443-772, Republic of Korea.

JURISDICTION AND VENUE

15. This action arises under the patent laws of the United States, Title 35 of the United States Code. Accordingly, this Court has subject matter jurisdiction under 28 U.S.C. §§ 1331 and 1338(a).

16. This Court has general and specific personal jurisdiction over Samsung. Samsung has sufficient contacts with this judicial district, including but not limited to a regular and established place of business for SEA located within the district at 1301 E. Lookout Drive,

Richardson, TX 75080 (“the Richardson facility”). Samsung also maintains multiple service centers within the District.

17. Venue is proper in this District under 28 U.S.C. § 1400(b). SEC is a foreign corporation, and SEA has a regular and established place of business located at the Richardson Facility. The Richardson Facility is located in the Eastern District of Texas and employs individuals residing in the Eastern District of Texas. On information and belief, Samsung develops and markets electronics out of the Richardson Facility. A substantial part of the infringement alleged in this Complaint has occurred and is occurring in this district, including the marketing, selling, and offering for sale of infringing products.

COUNT I

INFRINGEMENT OF U.S. PATENT NO. 9,781,408

18. Plaintiff VEI incorporates by reference each of the allegations in the foregoing paragraphs, and further alleges as follows:

19. On October 3, 2017, the United States Patent and Trademark Office issued the ‘408 Patent for inventions covering systems, which in one claimed embodiment comprise

- a. a storage adapted to store one or more image frames; and
- b. a processor adapted to obtain a first image frame from a first video stream;
- c. expand the first image frame to generate a modified image frame, wherein the modified image frame is different from the first image frame;
- d. generate a first altered image frame that includes first and second non-overlapping portions, wherein the first non-overlapping portion comprises a first portion of the modified image frame, wherein the first image frame does not include the second non-overlapping portion, wherein the modified image frame does not include the second non-overlapping portion; and
- e. generate a second altered image frame that includes third and fourth non-overlapping portions wherein the third non-overlapping portion comprises a second portion of the modified image frame, the second portion of the modified image frame

being different from the first portion of the modified image frame, wherein the first image frame does not include the fourth non-overlapping portion, wherein the modified image frame does not include the fourth non-overlapping portion.

20. A true and correct copy of the '408 Patent is attached as Exhibit A.

21. Samsung has been and is now directly and indirectly infringing one or more claims of the '408 Patent, in this judicial District and elsewhere in the United States.

22. For example, Samsung directly infringes the '408 Patent, including but not limited to claim 1, by making, using, selling, importing, and offering for sale Samsung televisions ("Samsung TVs"). The Samsung UNES8000 is representative of the products accused, which encompass other Samsung products having similar features, *e.g.*:

Figure 1. (Source: <https://www.digitaltrends.com/tv-reviews/samsung-un55es8000-review>)



Samsung UNES8000 series information: We based our review of the Samsung UN55ES8000 on our hands-on time spent with the 60-inch UN60ES8000 model. Samsung states that all the models in the ES8000 series have the same components (excepting for weight and dimensions) and should offer similar performances.

23. Samsung TVs comprise a storage adapted to store one or more image frames. For example, the UNES8000 is an LED TV, and accordingly must include a storage for the TVs display instructions to be stored on as well as being capable of storing one or more image frames.

Figure 2. (Source: <https://www.cnet.com/products/samsung-un55es8000/review/>)

The UNES8000 gets the company's dual-core processor, and can be upgraded via the Smart Evolution feature: processor and memory can be swapped out and upgraded at a later date (as early as 2013) and for an unspecified fee to allow improved functionality.

24. Samsung televisions include a processor adapted to obtain a first image frame from a first video stream. For example, the Samsung UNES8000 TV includes processors capable of obtaining a first image frame from a first video stream via any of its video input connections. The video stream could come from a cable box, DVD/Blu-Ray player, computer, or one of many other sources, *e.g.*:

Figure 3. (Source: <https://www.cnet.com/products/samsung-un55es8000/review/>; <https://www.samsung.com/us/support/owners/product/2012-led-smart-tv-es8000-series>) (red line added)

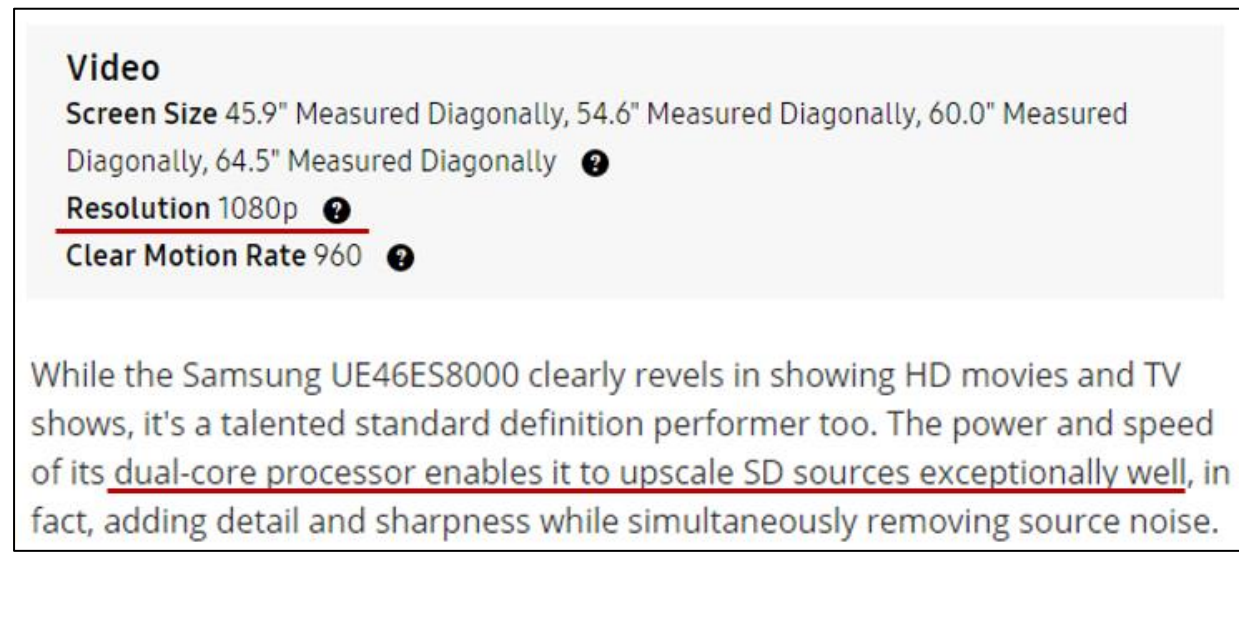
The UNES8000 gets the company's dual-core processor, and can be upgraded via the Smart Evolution feature: processor and memory can be swapped out and upgraded at a later date (as early as 2013) and for an unspecified fee to allow improved functionality.

Inputs & Outputs

HDMI 3 ?
USB 3 ?
Ethernet 1 ?
Component 1 ?
Composite In (AV) 1, 2 (1 shared with Component) ?
RF In (Terrestrial/Cable Input) 1 ?
PC/DVI Audio In (Mini Jack) 1 ?
Digital Audio Out (Optical) 1 ?
Audio Out (Mini Jack) 1 ?
RS232C 1

25. Samsung televisions expand the first image frame to generate a modified image frame, wherein the modified image frame is different from the first image frame. For example, the UNES8000 has a screen resolution of 1080p. It has an Upscaler, which in real-time expands the received image frames (*e.g.*, 720p) to a modified image frame with the screen's resolution (*e.g.*, 1080p). As the first image frame and the modified image frame are different sizes (*e.g.*, achieved through interpolation), the modified image frame is different from the first image frame, *e.g.*:

Figure 4. (Source: <https://www.samsung.com/us/support/owners/product/2012-led-smart-tv-es8000-series>; <http://www.techradar.com/reviews/audio-visual/televisions/plasma-and-lcd-tvs/samsung-ue46es8000-1078325/review/3>) (red lines added)



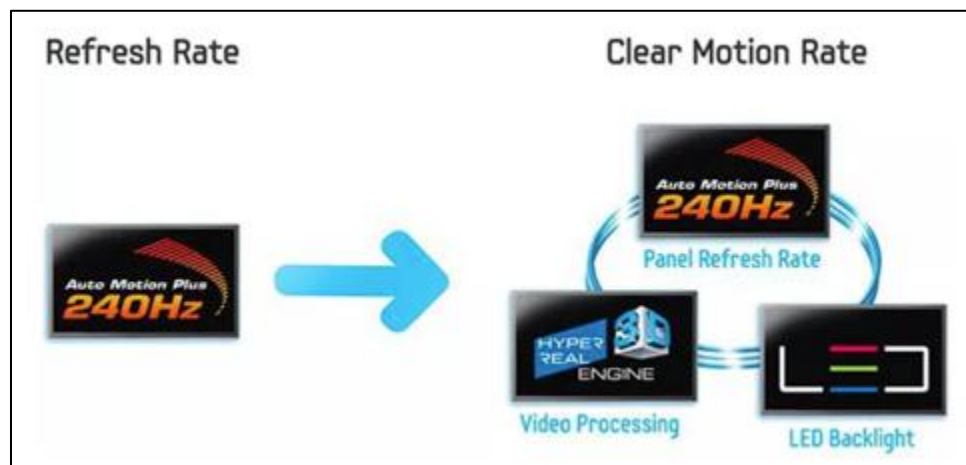
26. Samsung's TVs generate a first altered image frame that includes first and second non-overlapping portions. For example, the UNES8000 features Samsung's Motion Rate 960 technology. Samsung's Motion Rate 960 technology utilizes Backlight Scanning technology that adds additional frames between images to achieve a higher perceived refresh rate. This results in generating altered image frames with first and second non-overlapping portions, *e.g.*

Figure 5. (Source: <https://www.cnet.com/products/samsung-un55es8000/review/>) (red lines added)

was told it has a **240Hz** panel. The company's Clear Motion Rate specification, new for this year, supposedly includes refresh rate among its calculations, along with video processing and backlight scanning. For what it's worth -- not much, as far as I'm concerned -- the ES8000's CMR is said to be 960.

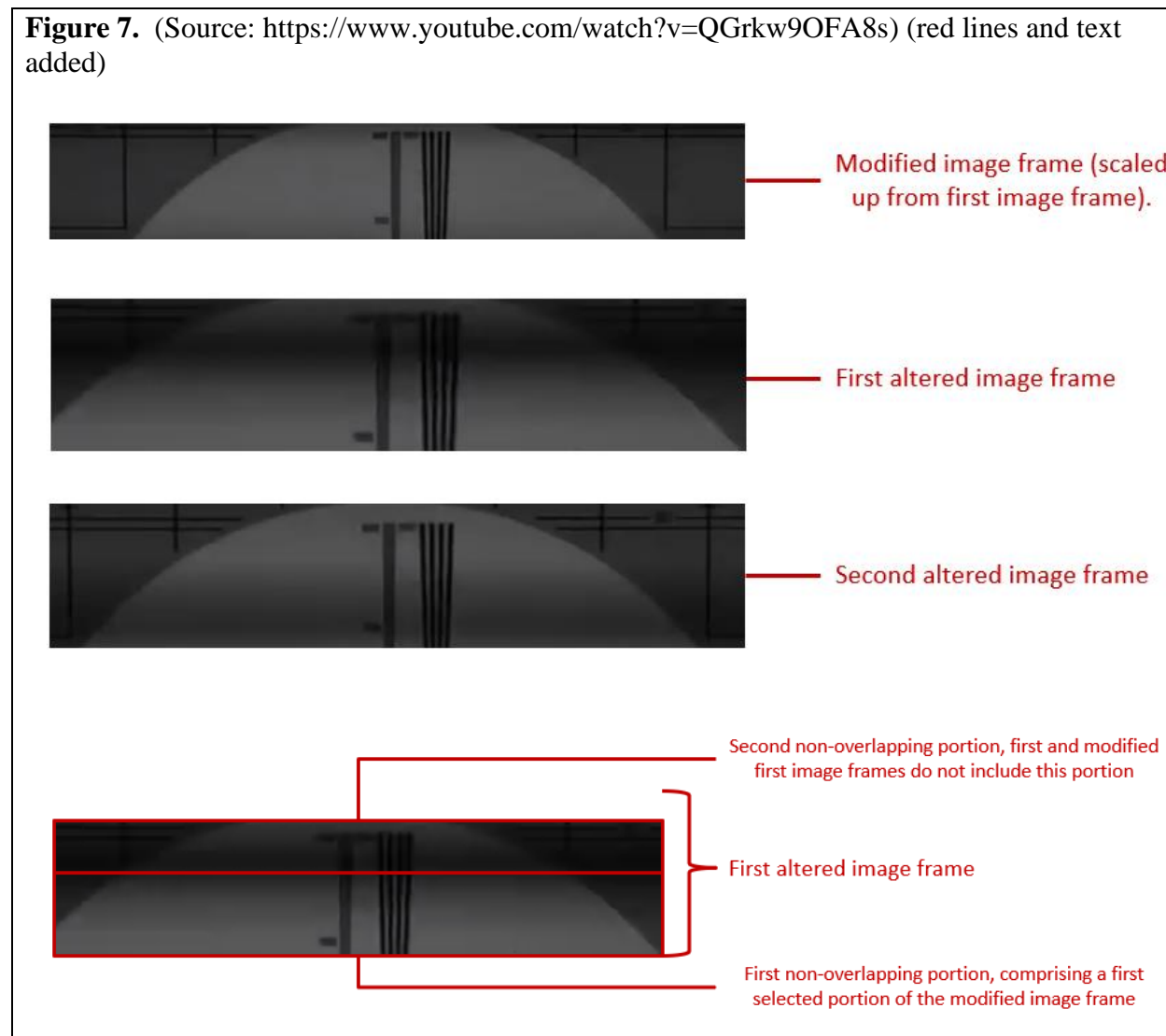
Figure 6. (Source: <https://www.cnet.com/news/fake-refresh-rates-is-your-tv-really-120hz/>) (red lines added)

Clear Motion Rate. "Samsung's more comprehensive Clear Motion Rate takes into account all three factors that contribute to motion clarity: panel refresh rate, image processor speed, and backlight technology." In other words, a TV with a CMR of 240 could be a 120Hz panel, with an average processor, and a scanning backlight, or a 60Hz panel, a fancy processor, and a scanning backlight. It's unlikely a TV with a CMR of 240 would be a 240Hz panel, as such an expensive panel would almost certainly come with one or both the other features. Here's an illustration showing how it gets the numbers.



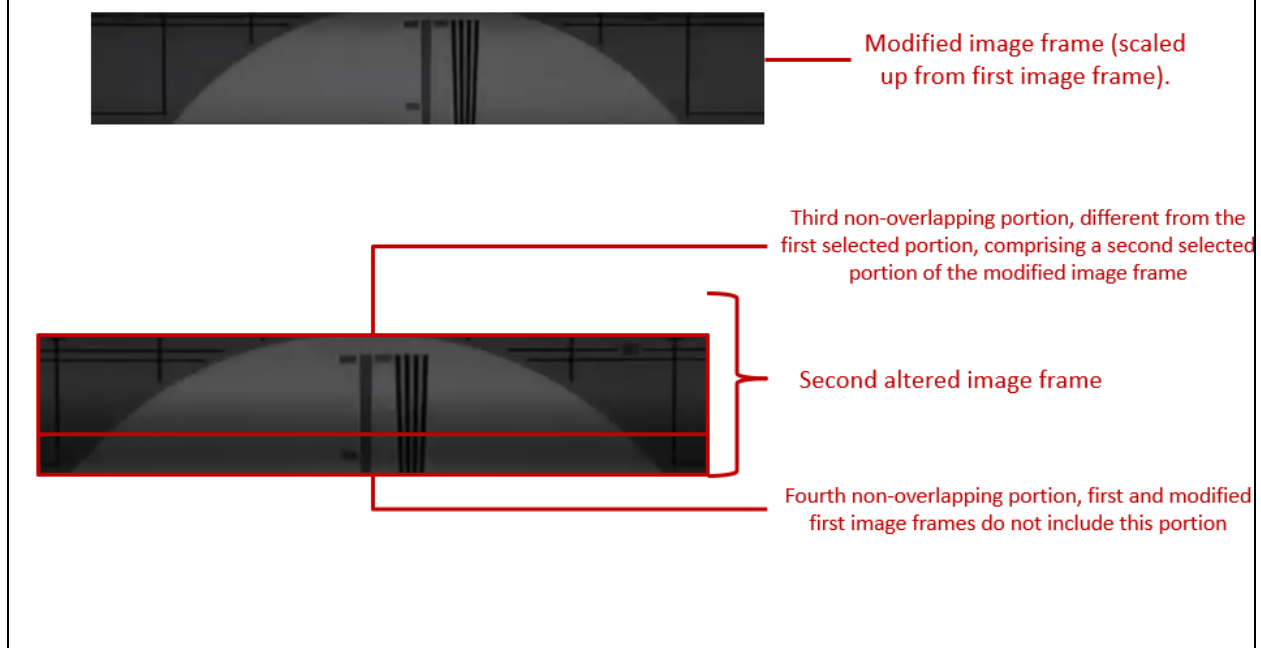
27. Samsung televisions generate a first altered image frame that includes first and second non-overlapping portions, where the first non-overlapping portion is a first portion of the modified image frame, wherein the first image frame does not include the second non-overlapping portion, wherein the modified image frame does not include the second non-overlapping portion. For example, the following are screenshots from a recording of a UNES8000 TV showing how backlight scanning generates a first and second altered image frame that includes first and second

non-overlapping portions:



28. Samsung televisions further generate a second altered image frame that includes third and fourth non-overlapping portions wherein the third non-overlapping portion comprises a second portion of the modified image frame, the second portion of the modified image frame being different from the first portion of the modified image frame, wherein the first image frame does not include the fourth non-overlapping portion, wherein the modified image frame does not include the fourth non-overlapping portion, *e.g.*:

Figure 8. (Source: <https://www.youtube.com/watch?v=QGrkw9OFA8s>) (red lines and text added)



29. By making, using, selling, importing, and offering for sale Samsung televisions and other similar products, Samsung is infringing the claims of the '408 Patent, including but not limited to claim 1. Samsung has committed these acts of infringement without license or authorization.

30. Samsung had actual knowledge of the '408 patent at least as early as February 2018, having been informed of the issuance of the '408 patent by VEI at that time, if not before.

31. Specifically, VEI – through its counsel – informed Samsung of the issuance of the '408 patent, and of Samsung's infringement of that patent by electronic communication on February 22, 2018. Samsung was provided with a copy of the patent on that same date.

32. Nonetheless, Samsung has continued to manufacture, sell and distributed the accused products after being informed of the '408 patent. Samsung's continued manufacture, sale and distribution, in the face of its knowledge of the '408 patent constitutes willful infringement.

33. Samsung has injured VEI and is liable to VEI for direct and indirect infringement of the claims of the '408 Patent pursuant to 35 U.S.C. § 271(a), (b), and (c).

34. As a result of Defendant's infringement of the '408 Patent, VEI has suffered harm and seeks monetary damages in an amount adequate to compensate for infringement, but in no event less than a reasonable royalty for the use made of the invention by Samsung, together with interest and costs as fixed by the Court.

35. Further, as a result of Samsung's willful violation, VEI is entitled to recover treble damages, or such multiple damages as the Court finds just, for Samsung's infringement of the '902 Patent.

COUNT II

INFRINGEMENT OF U.S. PATENT NO. 9,948,922

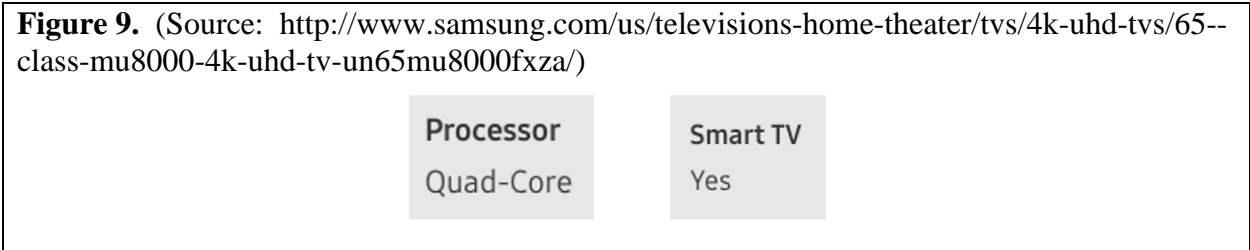
36. Plaintiff incorporates by reference each of the allegations in the foregoing paragraphs, and further alleges as follows:

37. On April 17, 2018, the United States Patent and Trademark Office issued the '922 Patent for inventions covering an apparatus which in one claimed embodiment comprises

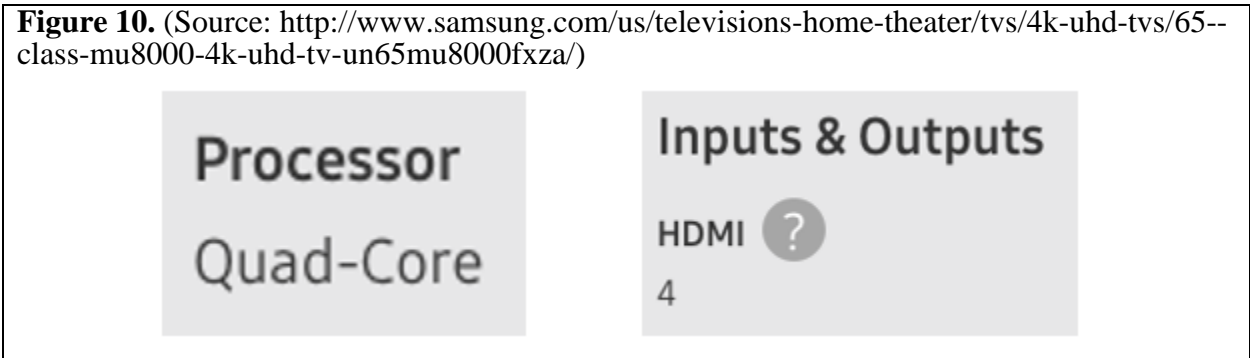
- a. a storage adapted to store one or more image frames;
- b. a processor adapted to obtain a first image frame and a second image frame from a first video stream;
- c. generate a first modified image frame by expanding the first image frame, wherein the first modified image frame is different from the first image frame;
- d. generate a second modified image frame by expanding the second image frame, wherein the second modified image frame is different from the second image frame;
- e. generate a bridge frame, wherein the bridge frame is a solid color, wherein the bridge frame is different from the first image frame and different from the second image frame;
- f. display the first modified image frame;
- g. display the bridge frame; and
- h. display the second modified image frame.

38. A true and correct copy of the '922 Patent is attached as Exhibit B.

39. Samsung has been and is now directly and indirectly infringing one or more claims of the '922 Patent, in this judicial District and elsewhere in the United States. For example, Samsung directly infringes the '922 Patent, including but not limited to claim 1, by making, using, selling, importing, and offering for sale Samsung televisions. For example, the Samsung 65" MU8000 is a Smart TV that includes a storage capable of storing one or more image frames., *e.g.*:

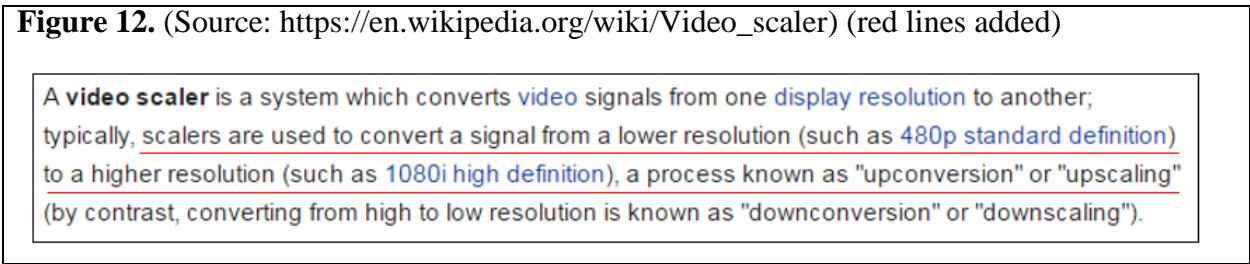
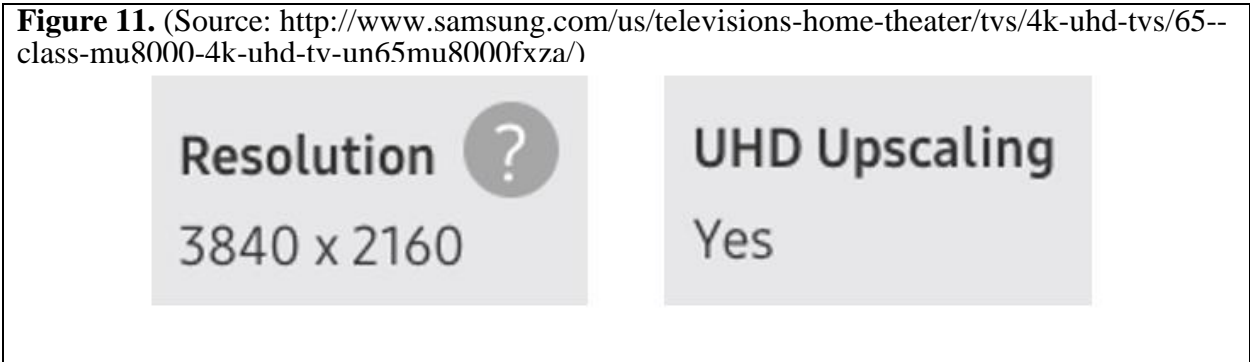


40. Samsung televisions include a processor adapted to obtain a first image frame and a second image frame from a first video stream. For example, the Samsung 65" MU8000 includes a processor capable of obtaining a first image frame and a second image frame from a first video stream via any of its video input connections. The video stream could come from a cable box, DVD/Blu-Ray player, computer, or one of many other sources, *e.g.*:

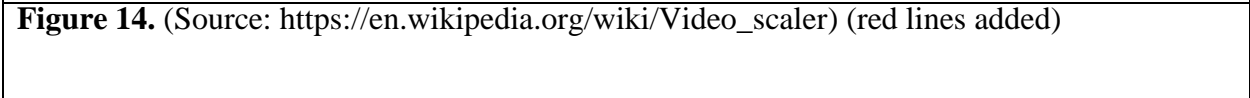
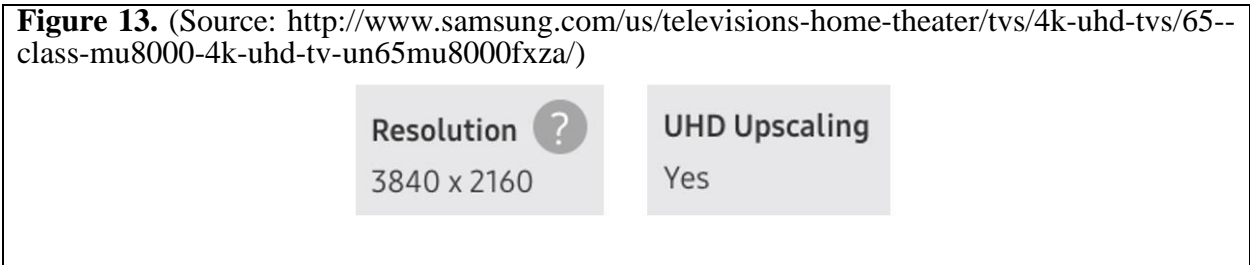


41. Samsung televisions generate a first modified image frame by expanding the first image frame, wherein the first modified image frame is different from the first image frame and generate a second modified image frame by expanding the second image frame, wherein the second modified image frame is different from the second image frame. Samsung TVs generate a first modified image frame by expanding the first image frame. For example, the Samsung 65" MU8000 has a screen resolution of 3840 x 2160 pixels. It performs upscaling which expands the

input frame in real-time to a modified image frame matching the screen resolution. Since the image frame and the first modified image frame are different sizes (e.g., achieved through interpolation), the first modified image frame is different from the first image frame, e.g.:



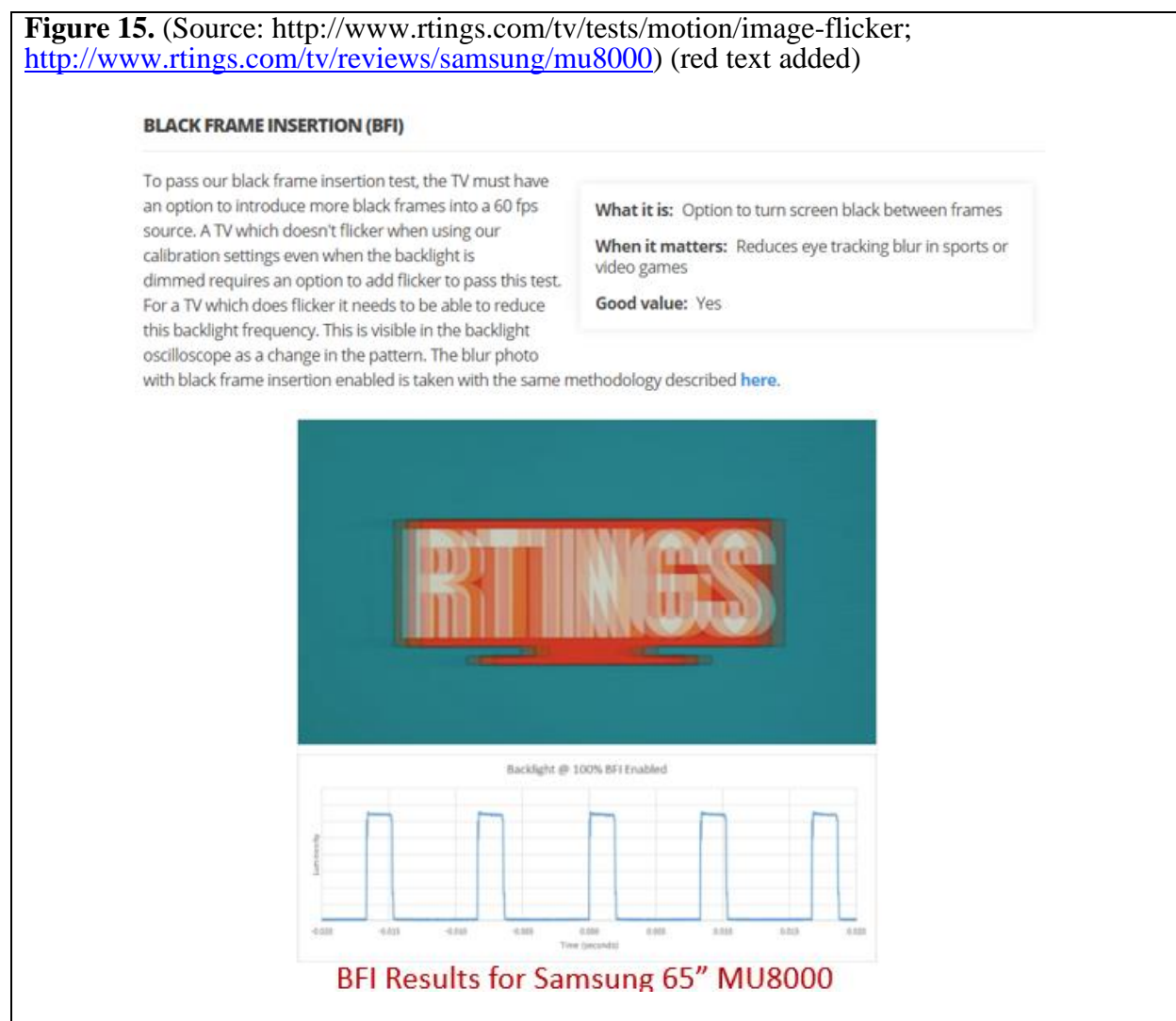
42. Samsung TVs generate a second modified image frame by expanding the second image frame. For example, the Samsung 65” MU8000 has a screen resolution of 3840 x 2160 pixels. It performs upscaling which expands the input frame in real-time to a modified image frame matching the screen resolution. Since the second image frame and the second modified image frame are different sizes (e.g., achieved through interpolation), the second modified image frame is different from the second image frame, e.g.:



typically, scalers are used to convert a signal from a lower resolution (such as 480p standard definition) to a higher resolution (such as 1080i high definition), a process known as "upconversion" or "upscaling" (by contrast, converting from high to low resolution is known as "downconversion" or "downscaling").

43. Samsung TVs generate a solid color bridge frame that is different from the first image frame and the second image frame. For example, the Samsung 65" MU8000 uses black frame insertion ("BFI"). BFI creates a solid black frame that is different from the first frame and different from the second image frame, *e.g.*:

Figure 15. (Source: <http://www.rtings.com/tv/tests/motion/image-flicker>; <http://www.rtings.com/tv/reviews/samsung/mu8000>) (red text added)



44. Samsung TVs display the first modified image frame, display the bridge frame, and display the second modified image frame. For example, the Samsung 65" MU8000 processor is

adapted to display the first modified image frame (*i.e.*, first upscaled image), the bridge frame (*i.e.*, black frame), and the second modified image frame (*i.e.*, second upscaled image), *e.g.*:

Figure 16. (Source: <http://www.samsung.com/us/televisions-home-theater/tvs/4k-uhd-tvs/65--class-mu8000-4k-uhd-tv-un65mu8000fxza/>)

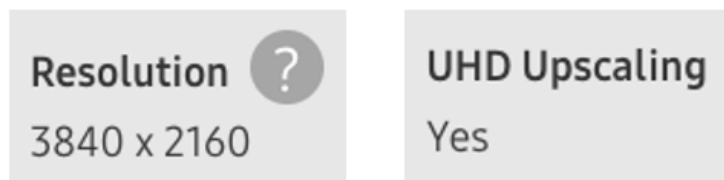
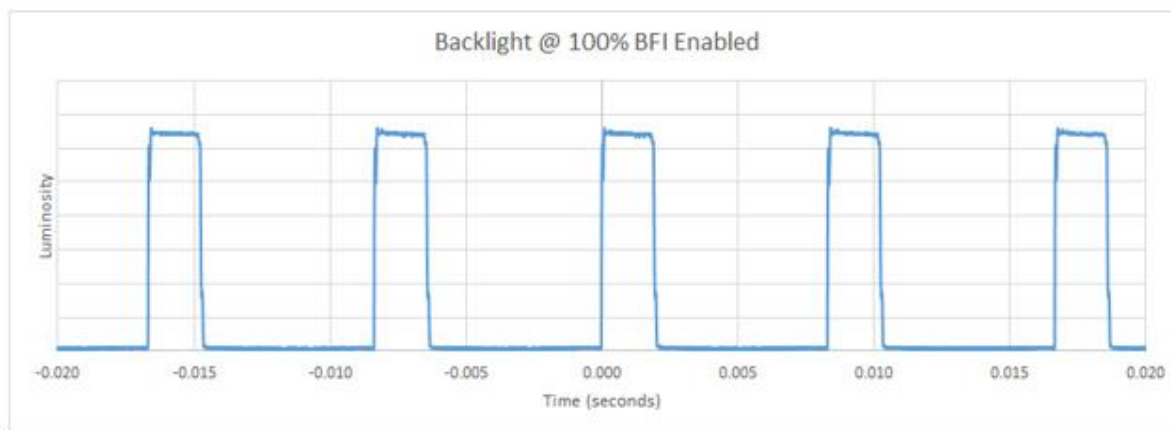


Figure 17. (Source: <http://www.rtings.com/tv/reviews/samsung/mu8000>)



45. By making, using, selling, offering for sale, and importing the subject televisions, Samsung is infringing the claims of the '922 Patent, including but not limited to claim 1. Samsung has committed these acts of infringement without license or authorization.

46. Samsung has injured VEI and is liable to VEI for direct and indirect infringement of the claims of the '922 Patent pursuant to 35 U.S.C. § 271(a), (b), and (c).

47. As a result of Samsung's infringement of the '922 Patent, VEI has suffered harm and seeks monetary damages in an amount adequate to compensate for infringement, but in no event less than a reasonable royalty for the use made of the invention by Samsung, together with interest and costs as fixed by the Court.

PRAYER FOR RELIEF

Plaintiff respectfully requests the following relief from this Court:

- A. That Samsung has directly and indirectly infringed the '408 and '408 Patents;
- B. That Defendant's infringement of the '902 and '408 patents is willful, entitling Plaintiff to enhanced damages under 35 U.S.C. § 284 as the Court finds just;
- C. That Samsung be ordered to pay damages to VEI, together with costs, expenses, pre-judgment interest, and post-judgment interest as allowed by law;
- D. A declaration that this case is exceptional under 35 U.S.C. § 285, and an award of VEI's reasonable attorneys' fees;
- E. That the Court enter judgment against Samsung, and in favor of VEI in all respects;
- F. For any such other and further relief as the Court deems just and equitable.

JURY TRIAL DEMANDED

Pursuant to Rule 38 of the Federal Rules of Civil Procedure, VEI requests a trial by jury of any issues so triable by right.

Dated: May 4, 2018

Respectfully submitted,

/s/ Nicole D. Galli

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